

**Notice of Allowability**

Application No.

09/998,921

Applicant(s)

JOHANSSON, STAFFAN

Examiner

Stephen M. D'Agosta

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2683

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to interview held on 7-28-2005.
2. ☒ The allowed claim(s) is/are 1-29.
3. ☒ The drawings filed on 03 December 2001 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All    b) ☐ Some\*    c) ☐ None    of the:
    1. ☐ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
  - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
    - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
  - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08),  
Paper No./Mail Date \_\_\_\_\_
4. ☐ Examiner's Comment Regarding Requirement for Deposit  
of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413),  
Paper No./Mail Date \_\_\_\_\_
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_

## DETAILED ACTION

### EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a personal interview with H. Warren Burnham on 7-28-2005.

**Primary Examiner's note:** The applicant's original amendment contained 30 claims with claim 26 being "cancelled". The examiner has removed this cancelled claim to simplify "entering of the amendment". Hence, there are now 29 allowed claims.

**Please replace ALL claims with the following:**

1. (Currently Amended) A method of operating a code division multiple access communication system having a source base station and a destination base station where a specified mobile station establishes a connection with the source base station, the method comprising:

initiating a handover of the connection involving the specified mobile station to the destination base station;

establishing a start position of a synchronization search window for the specified mobile station at a statistically-ascertained search window time position based on search window start time positions for other mobile stations which previously initiated handover from the source base station to the destination base station, the statistically-ascertained search window start time position for the specified mobile station being an average search window start time position for other mobile stations which previously initiated handover from the source base station to the destination base station;

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maintaining a filter which calculates a filter output value of the average search window start time position for the specified mobile station, wherein maintaining the filter comprises:

using a search window start time position found for a last mobile station which initiated handover from the source base station to the destination base station prior to the specified mobile station; and

using an output value of the filter prior to the filter being updated with the search window start time position found for the last mobile station which initiated handover from the source base station to the destination base station prior to the specified mobile station.

2. (Currently Amended) The method of claim 1, wherein the statistically-ascertained search window start time position is calculated using the expression

$$T_{\text{new}} = a * T_{\text{old}} + (1-a) * T_{\text{last}}$$

where:

$T_{\text{new}}$  is the filter output value of the average time position for the specified mobile;

$T_{\text{last}}$  is the search window start time position found for the last mobile station which initiated handover from the source base station to the destination base station prior to the specified mobile station;

$T_{\text{old}}$  is the output value of the filter prior to the filter being updated with the search window start time position found for the last mobile station which initiated handover from the source base station to the destination base station prior to the specified mobile station; and

$a$  is a weighting factor.

3. (Currently Amended) The method of claim 1, further comprising maintaining the filter at a radio network control node of the code division multiple access communication system.

4. (Currently Amended) The method of claim 1, further comprising:  
determining the statistically-ascertained search window start time position at a radio network controller node; and

communicating the statistically-ascertained search window start time position from the radio network controller node to the destination base station.

5. (Currently Amended) The method of claim 4, further comprising maintaining at the radio network control node a table which, for each of plural scenarios of source base stations and destination base stations, stores a corresponding scenario-specific statistically-ascertained search window start time position.

6. (Currently Amended) The method of claim 1, wherein if the specified mobile station is not found at the search window start time position, the method further comprises attempting to find a transmission of the specified mobile station by looking at a search window position which neighbors the search window start time position.

7. (Currently Amended) A method of operating a code division multiple access communication system having a source base station and a destination base station where a specified mobile station establishes a connection with the source base station, the method comprising:

- initiating a handover of the connection involving the specified mobile station to the destination base station;

- establishing a start position of a synchronization search window for the specified mobile station at a statistically-ascertained search window time position based on search window start time positions for other mobile stations which previously initiated handover from the source base station to the destination base station;

- if the specified mobile station is not found at the search window start time position, attempting to find a transmission of the specified mobile station by looking at a search window position which neighbors the search window start time position; and

- with a failure to find the transmission of the specified mobile station, looking at progressively remote neighboring search window positions relative to the search window start time position.

8. (Currently Amended) A method of operating a code division multiple access communication system having a source base station and a destination base station where a specified mobile station establishes a connection with the source base station, the method comprising:

- initiating a handover of the connection involving the specified mobile station to the destination base station;

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establishing a start position of a synchronization search window for the specified mobile station at a statistically-ascertained search window time position based on search window start time positions for other mobile stations which previously initiated handover from the source base station to the destination base station;

if the specified mobile station is not found at the search window start time position, attempting to find a transmission of the specified mobile station by looking at a search window position which neighbors the search window start time position; and

if the specified mobile station is not found at the search window start time position, attempting to find the transmission of the specified mobile station by:

looking a first neighboring search window position on a first side of the search window start time position; and then, if necessary,

looking at a second neighboring search window position on a second side of the search window start time position.

9. (Currently Amended) The method of claim 8, wherein the first neighboring search window position on the first side of the search window start time position and the second neighboring search window position on the second side of the search window start time position comprise a set of most neighboring search window positions, and wherein, upon failure to find the transmission of the specified mobile station at either of the most neighboring search window positions, looking at progressively remote sets of neighboring search window positions.

10. (Original) The method of claim 1, further comprising synchronizing the destination base station with a transmission from the specified mobile station using the search window to detect a transmission of the specified mobile station received at the destination base station.

11. (Currently Amended) A code division multiple access communication system comprising:

a source base station;

a destination base station having a synchronization searcher;

a time position estimator which establishes a start position of a synchronization search window for the synchronization searcher of the destination base station, the synchronization search window being used to detect a transmission of a specified

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mobile station received at the destination base station during a handover of a connection involving the specified mobile station from a source base station to the destination base station, the time position estimator establishing the start position of the synchronization search window as a statistically-ascertained search window time position based on time positions for other mobile stations which previously initiated handover from the source base station to the destination base station;

wherein the statistically-ascertained time position for the specified mobile station is an average search window start time position for other mobile stations which previously initiated handover from the source base station to the destination base station, wherein the time position estimator maintains a filter which calculates a filter output value of the average time position for the specified mobile station;

wherein the filter uses a search window start time position found for a last mobile station which initiated handover from the source base station to the destination base station prior to the specified mobile station; and

wherein the filter uses an output value of the filter prior to the filter being updated with the time position found for the last mobile station which initiated handover from the source base station to the destination base station prior to the specified mobile station.

12. (Currently Amended) The apparatus of claim 11, wherein the statistically-ascertained time position is calculated using the expression

$$T_{\text{new}} = a \cdot T_{\text{old}} + (1-a) \cdot T_{\text{last}}$$

where:

$T_{\text{new}}$  is the filter output value of the average time position for the specified mobile;

$T_{\text{last}}$  is the search window start time position found for the last mobile station which initiated handover from the source base station to the destination base station prior to the specified mobile station;

$T_{\text{old}}$  is the output value of the filter prior to the filter being updated with the time position found for the last mobile station which initiated handover from the source base station to the destination base station prior to the specified mobile station; and

$a$  is a weighting factor.

13. (Original) The apparatus of claim 11, wherein the time position estimator resides at a radio network control node of the code division multiple access communication system.

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14. (Currently Amended) The apparatus of claim 13, wherein the radio network controller node communicates the search window start time position to the destination base station.

15. (Currently Amended) The apparatus of claim 11, wherein the time position estimator maintains a table which, for each of plural scenarios of source base stations and destination base stations, stores a corresponding scenario-specific search window start time position.

16. (Currently Amended) The apparatus of claim 11, wherein if the specified mobile station is not found at the search window start time position, the destination base station attempts to find a transmission of the specified mobile station by looking at a search window position which neighbors the start time position.

17. (Currently Amended) A code division multiple access communication system comprising:

- a source base station;

- a destination base station having a synchronization searcher;

- a time position estimator which establishes a start position of a synchronization search window for the synchronization searcher of the destination base station, the synchronization search window being used to detect a transmission of a specified mobile station received at the destination base station during a handover of a connection involving the specified mobile station from a source base station to the destination base station, the time position estimator establishing the start position of the synchronization search window as a statistically-ascertained search window time position based on time positions for other mobile stations which previously initiated handover from the source base station to the destination base station;

- wherein if the specified mobile station is not found at the search window start time position, the destination base station attempts to find a transmission of the specified mobile station by looking at a search window position which neighbors the start time position; and

- wherein, with a failure to find the transmission of the specified mobile station, the destination base station looks at progressively remote neighboring search window positions relative to the start time position.

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18. (Currently Amended) A code division multiple access communication system comprising:

- a source base station;

- a destination base station having a synchronization searcher;

- a time position estimator which establishes a start position of a synchronization search window for the synchronization searcher of the destination base station, the synchronization search window being used to detect a transmission of a specified mobile station received at the destination base station during a handover of a connection involving the specified mobile station from a source base station to the destination base station, the time position estimator establishing the start position of the synchronization search window as a statistically-ascertained search window time position based on time positions for other mobile stations which previously initiated handover from the source base station to the destination base station;

- wherein if the specified mobile station is not found at the search window start time position, the destination base station attempts to find a transmission of the specified mobile station by looking at a search window position which neighbors the start time position; and

- wherein if the specified mobile station is not found at the start time position, the destination base station attempts to find the transmission of the specified mobile station by looking at a first neighboring search window position on a first side of the search window start time position, and then, if necessary, looking at a second neighboring search window position on a second side of the search window start time position.

19. (Currently Amended) The apparatus of claim 18, wherein the first neighboring search window position on the first side of the search window start time position and the second neighboring search window position on the second side of the search window start time position comprise a set of most neighboring search window positions, and wherein, upon failure to find the transmission of the specified mobile station at either of the most neighboring search window positions, the destination base station looks at progressively remote sets of neighboring search window positions.

20. (Previously Presented) The apparatus of claim 11, wherein the destination base station starts synchronization of a mobile-to-source leg when the searcher sees a predetermined transmission from the specified mobile station.



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21. (Currently Amended) A time position estimator situated at a node of code division multiple access communication system comprising, the time position estimator serving to establish a start position of a synchronization search window for a synchronization searcher of a destination base station, the synchronization search window being used to detect a transmission of a specified mobile station received at the destination base station during a handover of a connection involving the specified mobile station from a source base station to the destination base station, the time position estimator establishing the start position of the synchronization search window as a statistically-ascertained search window start time position based on search window start time positions for other mobile stations which previously initiated handover from the source base station to the destination base station;

wherein the statistically-ascertained time position for the specified mobile station is an average search window start time position at which other mobile stations previously initiated handover from the source base station to the destination base station, wherein the time position estimator maintains a filter which calculates a filter output value of the average search window start time position for the specified mobile station;

wherein the filter uses a search window start time position found for a last mobile station which initiated handover from the source base station to the destination base station prior to the specified mobile station; and

wherein the filter uses an output value of the filter prior to the filter being updated with the time position found for the last mobile station which initiated handover from the source base station to the destination base station prior to the specified mobile station.

22. (Currently Amended) The apparatus of claim 21, wherein the statistically-ascertained time position is calculated using the expression

$$T_{\text{new}} = a \cdot T_{\text{old}} + (1-a) \cdot T_{\text{last}}$$

where:

$T_{\text{new}}$  is the filter output value of the average time position for the specified mobile;

$T_{\text{last}}$  is the search window start time position found for the last mobile station which initiated handover from the source base station to the destination base station prior to the specified mobile station;

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$T_{old}$  is the output value of the filter prior to the filter being updated with the time position found for the last mobile station which initiated handover from the source base station to the destination base station prior to the specified mobile station; and  $a$  is a weighting factor.

23. (Original) The apparatus of claim 21, wherein the time position estimator resides at a radio network control node of the code division multiple access communication system.

24. (Currently Amended) The apparatus of claim 23, wherein the radio network controller node communicates the search window start time position to the destination base station.

25. (Currently Amended) The apparatus of claim 21, wherein the time position estimator maintains a table which, for each of plural scenarios of source base stations and destination base stations, stores a corresponding scenario-specific search window start time position.

26. (Currently Amended) A synchronization searcher for a destination base station of a code division multiple access communication system, the synchronization searcher using a synchronization search window to detect a transmission of a mobile station during a handover of a connection involving the mobile station to the destination base station, there being a start position of the synchronization search window, the start position of the synchronization search window being based on search window start time positions for other mobile stations which previously initiated handover from the source base station to the destination base station, wherein if the specified mobile station is not found at the search window start time position, the synchronization searcher attempts to find the transmission of the mobile station by looking at a search window position which neighbors the search window start time position;

wherein, with a failure to find the transmission of the specified mobile station, the synchronization searcher looks at progressively remote neighboring search window positions relative to the search window start time position.

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27. (Currently Amended) The apparatus of claim 26, wherein the synchronization searcher starts synchronization of a mobile-to-source leg upon seeing a predetermined transmission from the mobile station.

28. (Currently Amended) A synchronization searcher for a destination base station of a code division multiple access communication system, the synchronization searcher using a synchronization search window to detect a transmission of a mobile station during a handover of a connection involving the mobile station to the destination base station, there being a start position of the synchronization search window, the start position of the synchronization search window being based on search window start time positions for other mobile stations which previously initiated handover from the source base station to the destination base station, wherein if the specified mobile station is not found at the search window start time position, the synchronization searcher attempts to find the transmission of the mobile station by looking at a search window position which neighbors the search window start time position;

wherein if the specified mobile station is not found at the search window start time position, the synchronization searcher attempts to find the transmission of the mobile station by looking at a first neighboring search window position on a first side of the search window start time position, and then, if necessary, looking at a second neighboring search window position on a second side of the search window start time position.

29. (Currently Amended) The apparatus of claim 28, wherein the first neighboring search window position on the first side of the search window start time position and the second neighboring search window position on the second side of the search window start time position comprise a set of most neighboring search window positions, and wherein, upon failure to find the transmission of the specified mobile station at either of the most neighboring search window positions, the synchronization searcher looks at progressively remote sets of neighboring search window positions.

***Allowable Subject Matter***

The following is an examiner's statement of reasons for allowance:

1. The examiner and applicant's attorney held an in-person interview on 7-28-2005 whereby they discussed the novel material of the application. They decided that novel claim 2 could have certain details removed (eg. formula and weighting factor) and still remain novel. Hence this has been entered via amendment (along with other amendments containing other novel material):

2. Attached is pertinent art Wheatley US 6,151,311 and Yang US 7,717,978.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen M. D'Agosta whose telephone number is 571-272-7862. The examiner can normally be reached on M-F, 8am to 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bill Trost can be reached on 571-272-7872. The fax phone number for the organization where this application or proceeding is assigned is 571-272-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Stephen D'Agosta  
Primary Examiner  
7-29-2005

